S/048/62/026/010/011/013
B117/B186

AUTHORS: Vyshinskiy, N. N., Aleksandrov, Yu. A., and Rudnevskiy, N. K.

TITLE: Vibration spectra of organic tin and lead compounds and their analytical application

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 10, 1962, 1285-1287

TEXT: Unlike the spectra of tetra- and hexaethyl derivatives, the infrared absorption spectrum of triethyl germanium, that of triethyl tin, and that of triethyl lead oxides (Et_3MOMEt_3) of corresponding ethylates (Et_3MOEt) and triethyl tin peroxide ($Et_3SnOOSnEt_3$), which were examined here (M = Ge, Sn, Pb; Et = C_2H_5), display intense bands (Ge = 856, Sn = 776, Pb = 638 cm^{-1}) which are suited for analytical purposes and can be attributed to the asymmetric vibrations of the M-O-M' group. It has been shown that the force constant of the M-O bond can be estimated under certain conditions relatively to the valence angles of the M-O-M group.
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The resulting values can be used to estimate the vibration frequencies of the M-O bond in triethyl germanium, triethyl tin, and triethyl lead ethylate. The vibration frequency of the Pb-O bond in an Et_3PbOEt molecule corresponds obviously to the asymmetric vibration frequency of the PbC_3 group. In the range about 590 cm^{-1}, the spectrum of Et_3SnOEt shows a band of medium intensity, which can be attributed to the vibration of Sn-O. The question whether the weak band detected in the Et_3GeOEt spectrum near 650 cm^{-1} can be assigned to the vibrations of the Ge—O bond has not yet been answered. For analytical purposes, however, the intense bands found in the spectra of ethylates around 900 cm^{-1} and between 1050 and 1100 cm^{-1} are more important. The 550 cm^{-1} band in the spectrum of triethyl tin peroxide and the 790 cm^{-1} band in the spectrum of triethyl silicon peroxide must be attributed to the stretching vibrations of the Sn-O and Si-O bond, respectively. The characteristics of the spectra under examination made it possible to investigate the mechanism underlying the oxidation of hexaethyl diplumbane and hexaethyl distannane as well as the properties of triethyl tin peroxide (Yu. A. Aleksandrov, N. N. Vyshinskiy, Tr. po khimii i khim. tekhnologii, Gor'kiy, 3, 656 (1961)). There are 3 figures.

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ACCESSION NR: AT4028346 S/0000/63/000/000/0291/0297

AUTHOR: Aleksandrov, Yu. A.; Brilkina, T. G.; Shushunov, V. A.

TITLE: Some tin and lead organic peroxide compounds

SOURCE: Soveshchaniye po khimii perekisny*kh soyedineniy. Second, Moscow, 1961. Khimiya perekisny*kh soyedineniy (chemistry of peroxide compounds); Doklady* soveshchaniy. Moscow, Izd-vo AN SSSR, 1963, 291-297

TOPIC TAGS: tin, lead, peroxide, tin organic compound, lead organic compound, peroxide compound, metal-organic compound, metal-organic peroxide

ABSTRACT: Results of the investigation of some properties and reactions of triethyl tin peroxide, tert-butal triethyl lead peroxide, α-cumyl triethyl lead peroxide, di-tri-ethyl lead-n-di-isopropobenzene diperoxide, as well as triphenyl-tin-peracetate and triphenyl-tin-perpropenate, triphenyl-lead-peracetate, triethyl-lead peracetate and triethyl-lead perbenzoite are related in this article. The peroxide compounds were easily hydrolyzed by water with the formation of triethyl-tin monohydroxide (or triethyl lead monohydroxide) and hydrogen peroxide (or the corresponding hydro-peroxide) at room temperature. The results of the analysis are presented in a table. The above mentioned compounds were produced, precipitated, and characterized for the

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ACCESSION NR: AT4028346

first time. The thermal decay of triethyl tin peroxide and its reaction with hexaethyldi-tin in a n-ionane solution was investigated. Definite results were obtained which indicate the decay of triphenyl tin peracetate and triphenyl tin perproponate, as well as triphenyl lead peracetate by means of regrouping. Orig. art. has: 3 formulas, 6 figures and 1 table.

ASSOCIATION: Gor'kovskiy gosudarstvenny*y universitet im. N.I. Lobachevskogo (Gorky State University)

SUBMITTED: 13Dec63 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: CH NO REF SOV: 011 OTHER: 011

Card 2/2

ALEKSANDROV, Yu.A.; DRUZHKOV, O.N.; ZHIL'TSOV, S.F.; RAZUVAYEV, G.A.

Certain regularities in the liquid phase oxidation of diisopropyl-mercury by oxygen. Dokl. AN SSSR 157 no.6:1395-1398 Ag '64.
(MIRA 17:9)

1. Chlen-korrespondent AN SSSR (for Razuvayev).

ALEKSANDROV, Yu.A.; SHUSHUNOV, V.A.

Metallo-organic peroxide compounds. Part 5: Triethyltin hydroperoxide peroxyhydrate. Zhur. ob. khim. 35 no.1:115-117 Ja '65.
(MIRA 18:2)

RAZUVAYEV, G.A.; ZHIL'TSOV, S.F.; ALEKSANDROV, Yu.A.; LUZHKOV, O.N.

Preparation and certain properties of isopropyl mercury isopropylate. Zhur. ob. khim. 35 no.7:1152-1156 Jl '65. (MIRA 18:8)

ALEKSANDROV, Yu.A.; DRUZHKOV, O.N.; ZHIL'TSOV, S.F.; RAZUVAYEV, G.A.

Kinetics and mechanism of the liquid-phase oxidation of diisopropylmercury. Zhur. ob. khim. 35 no.8:1440-1447 Ag '65. (MIRA 18:8)

ALEKSANDROV, Yu.A.

Calculation of the thawing of frozen ground around hot water pipes.
Prom. stroi. 42 no.3:46-47 '65. (MIRA 18:7)

L 09058-67 EWT(m)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6031991 SOURCE CODE: UR/0386/66/004/005/0196/0200

AUTHOR: Aleksandrov, Yu. A.; Samosvat, G. S.; Sereeter Zh.; Tsoy Gen Sor

ORG: Joint Institute of Nuclear Research (Ob"yedinennyy institut yadernykh issledovaniy)

TITLE: Scattering of kilovolt neutrons by lead and electric polarizability of the neutron

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 5, 1966, 196-200

TOPIC TAGS: neutron scattering, neutron polarization, lead, neutron spectroscopy

ABSTRACT: This is a continuation of earlier work by the authors (Preprint OIYaI, R-2495, Dubna 1965 and elsewhere) on neutron scattering by lead at neutron energies down to 7.5 kev, where it was indicated that the estimate $\alpha_n \leq 20 \times 10^{-42}$ cm^3 for the neutron electric polarizability coefficient, previously obtained by R. M. Thaler (Phys. Rev. v. 114, 827, 1965) in scattering by uranium, can be appreciably lowered. Lead was chosen in the present investigation because it has no strong neutron resonances in the investigated energy range up to 26 kev, thus avoiding the ambiguity connected with neglecting the role of the resonances. The measurements were made with the OIYaI pulsed reactor by the time-of-flight method with a 250 m base and with an energy resolution ranging from 20% at 1 kev to 100% at 26 kev. The effective energy was determined at each point by numerical integration with account of the re-

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solution function, the neutron spectrum, and the energy sensitivity of the detectors. A total of 180 proportional boron counters (type SNMO-5) were used as detectors. The intensity of the neutrons scattered by a hollow lead cylinder of 10 cm diameter and 1 cm wall thickness was measured simultaneously at all energies and 9 values of the scattering angle from 30 to 150°. Reduction of the experimental data yielded the estimate $\alpha_n = (0.3 \pm 9.2) \times 10^{-42}$ cm^3. A more accurate estimate of the polarizability is obtained by simultaneous reduction of the present data and published data on scattering by lead in the 50 - 160 kev interval. Such a reduction yields $\alpha_n = (0.7 \pm 5.4) \times 10^{-42}$ cm^3. It is thus concluded that, with a probability ~68%, the values of α_n range between -4.7 and 6.1 ($\times 10^{-42}$) cm^3 and are of the same order of magnitude as the theoretically expected value $(1 - 2) \times 10^{-42}$ cm^3. The authors thank F. L. Shapiro for interest in the work and useful discussions, and A. A. Loshkarev for help with the measurements. Orig. art. has: 2 figures and 4 formulas.

SUB CODE: 20/ SUBM DATE: 10Jun66/ ORIG REF: 005/ OTH REF: 004

Cord 2/2 nst

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1739
AUTHOR ALEKSANDROV, Yu.A., BONDARENKO, I.I.
TITLE On the Scattering of Fast Neutrons by the COULOMB Field of a Nucleus.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.4, 726-727 (1956)
Issued: 1 / 1957

At first some previous works dealing with this topic are mentioned. In the present work the angular distribution of the fast neutrons which are emitted from the reactor and are scattered by Pb and Cu is discussed. The data given below are preliminary results. The neutron bundle was limited by a steel collimator to an extent of 0,9 x 3,6 cm^2. At a distance of 10 cm from the end of the collimator a scatterer consisting of a Pb- or Cu-plate of 1 cm thickness was fitted. The detector, which was arranged at a distance of 325 cm from the plate, was a photomultiplier with plastic scintillator (ZnS in plexiglass) with low sensitivity with respect to γ-rays and neutrons of an energy of less than 1,5 MeV. Before work started, the effective total number of electrons impining on the scatterer was determined, which made computation of the differential scattering cross section $\sigma(\Theta)$ possible. The effective energy of the neutrons determined from the cross section of nuclear scattering amounted to from 3 to 4 MeV.
The results of measuring of the angular distribution are shown in form of a diagram; the curve was constructed according to SCHWINGER's theoretical formula. From measuring results it may be seen that an increase of the cross

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section, which is characteristic of SCHWINGER'S scattering, is observed for Pb(Z = 82) within the range of the angles $< 2^{o}$. The value of the cross section agrees with theoretical results obtained by SCHWINGER and SAMPLE. For Cu (Z = 29) the increase of cross section is within the limits of measuring errors.

In the work by R.G.P.VOSS and R.WILSON, Phil.Mag.,ser.8, 1, 175 (1956) which was recently published, the authors observed a SCHWINGER scattering of 100 MeV neutrons by uranium. The dependence of the cross section on the angle resembles the theoretical curve, but numerical values of $\sigma(\theta)$ are not mentioned by the authors.

In conclusion it must be mentioned that - as is shown by evaluations - in the case of an existing "polarizability" $\alpha \sim r^3$ of the neutron (r - extension of the nucleon), the additional contribution to the cross section of scattering of neutrons by heavy nuclei attains a considerable magnitude. This effect increases with reduced energy, but more carefully carried out experiments are necessary for determining this effect.

INSTITUTION:

ALEKSANDROV, Yu. A.

(Acad. Sci. USSR)

"Small Angle Scattering of Fast Neutrons by Heavy Nuclei,"

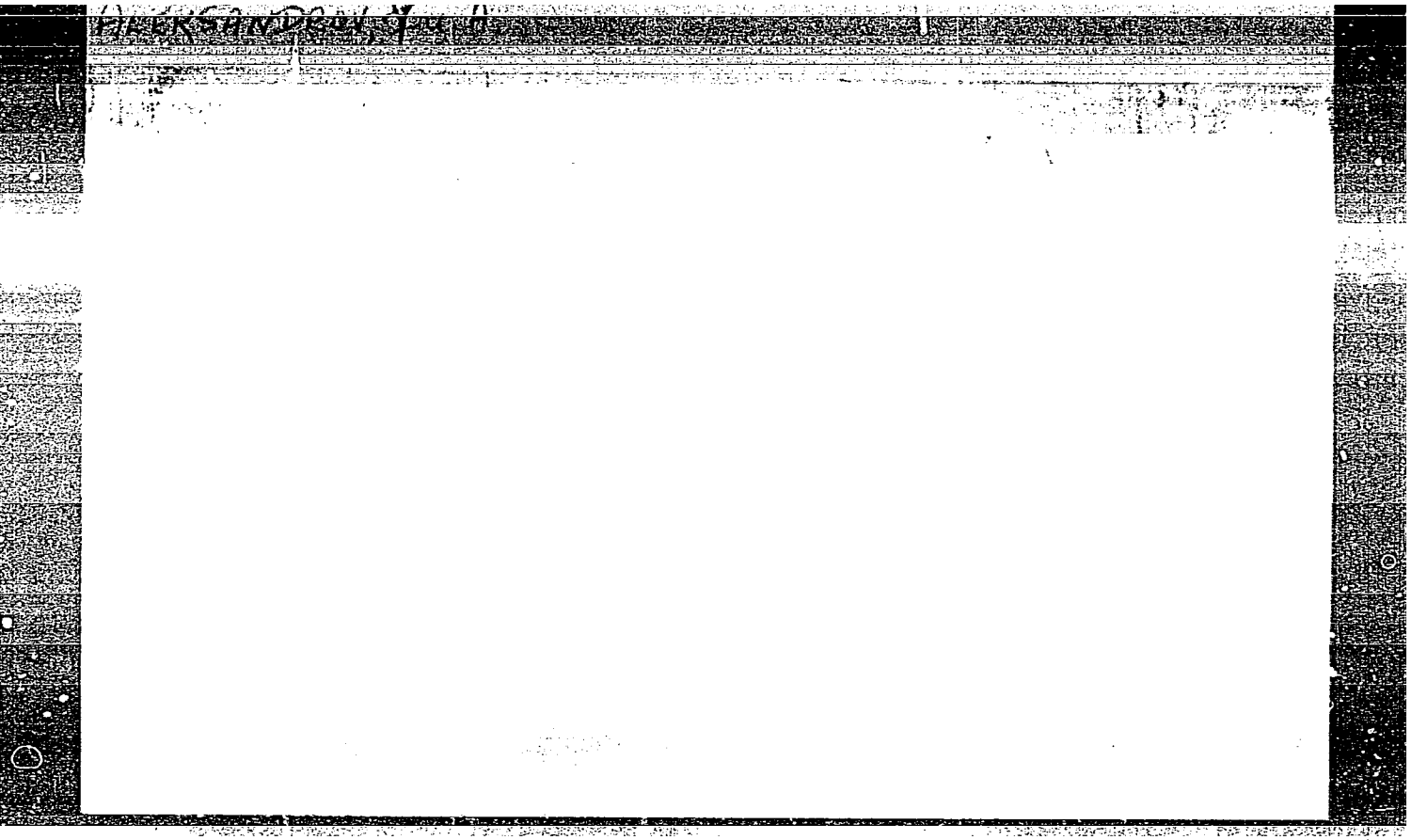
paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

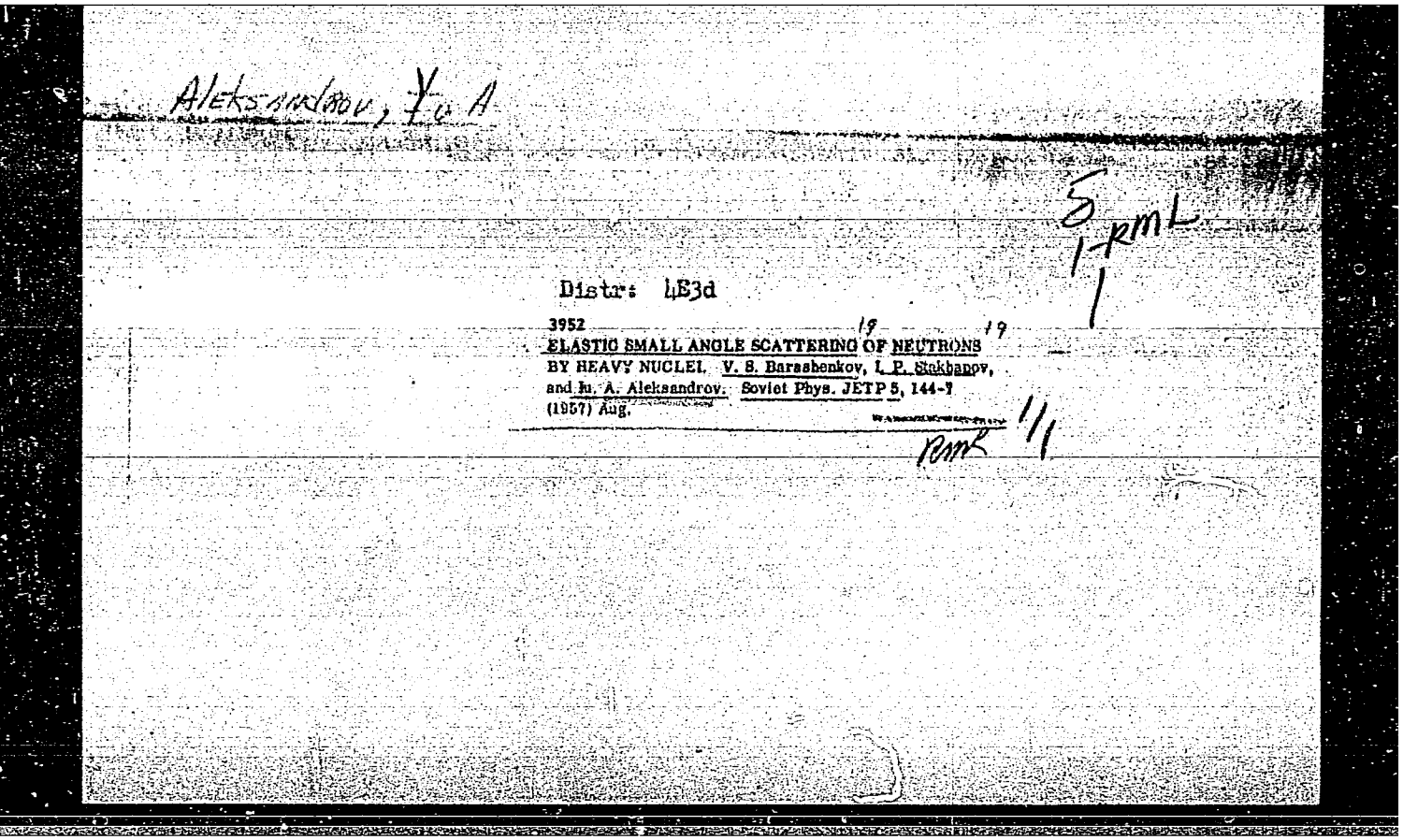
ALEKSANDROV, Yu.A., DELONE, N.V., SLOVOKHOTOV, L.I., SOKOL, G.A.
SMIARKOV, I.N.

"Photodisintegration of Deuteron at 50-150 Mev."

Lebedev Physics Inst. Acad. Sci. USSR.

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.





Aleksandrov, Yu A

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ELASTIC SMALL ANGLE SCATTERING OF NEUTRONS BY HEAVY NUCLEI. V. S. Barashenkov, I. P. Stakhanov, and Iu. A. Aleksandrov. Soviet Phys. JETP 5, 144-7 (1957) Aug.

RMK 1/1

ALEKSANDROV, YU.A.

AUTHOR: BARAŠENKO,V.S., STACHANOV,I.P., ALEKSANDROV,YU.A. PA - 2076

TITLE: Elastic Small Angle Scattering of Neutrons by Heavy Nuclei. (Uprugoe rassejanie neutronov tjaželymi jadrami na malye ugly, Russian)

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1957, Vol 32, Nr 1, pp 154-156 (U.S.S.R.)
Received: 3 / 1957 Reviewed: 4 / 1957

ABSTRACT: The latest works on the scattering of fast electrons by hydrogen confirm the conclusions of the meson theory concerning the extensive distribution of the electric charge in the nucleon. This charge distribution is due to a "cloud" of charged mesons round a central nucleus. Under the influence of an exterior field the distribution of electric charge in the nucleon will change. Above all, a polarization of the homologously charged meson cloud and of the nucleus in the nucleon can be expected and the neutron will then probably receive an induced electric dipole moment $\vec{p} = \alpha\vec{E}$, a fact which becomes apparent by an abnormal behavior of the differential cross section of the scattering of neutrons by heavy nuclei into small angles. If it is assumed in first rough approximation that the meson field of a neutron in an exterior electric field $\vec{E} = \vec{k}V/z$ (with $\alpha = 1$) can be

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Elastic Small Angle Scattering of Neutrons by Heavy Nuclei.

described by the statistical equation:
$[\nabla^2 + (e/c\hbar)^2 E^2 z^2] \varphi - (mc/\hbar)^2 \varphi = (4\pi/c) g \delta(\vec{r})$, it applies for the induced electric dipole moment that

$$\vec{p} = -\frac{e^2 g^2}{\hbar^2 c^2} E \int z^2 \frac{\exp(-2mcr/\hbar)}{r^2} d^3 x + O(E^2).$$

Therefrom it further results that

$\alpha(\hbar c/g^2) = (e\hbar/mc^2)^2 \pi/3m = 2{,}1.10^{-41}$.

In consequence of electric polarization the neutron is subjected to an additional scattering of the COULOMB field of the nucleus. Polarization scattering attains its maximum if the collision parameter is restricted by the condition R d a. Here $R = 1{,}5.10^{-13} A^{1/3}$ denotes the radius of the nucleus and $a = 0{,}53.10^{-8} Z^{1/3}$ the radius of the electron cloud. For the energy of the interaction between neutron and nucleus it is in this case true that

$$H(\vec{r}) = U(\vec{r}) - \mu (iZ/2r^3)(\hbar e/mc)^2 \sigma [\vec{r} \nabla] - \alpha Z^2 e^2 1/r^4.$$

The first term denotes the pure nuclear forces and the second

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ALEKSANDROV, Yu.A.

ALEKSANDROV, Yu.A.; DMLONE, N.B.; SLOVOKHOTOV, L.I.; SOKOL, G.A.; SHTARKOV, L.N.

Photodisintegration of deuterons at energies from 50 to 150 Mev.
Zhur. eksp. i teor. fiz. 33 no.3:614-620 S '57. (MLRA 10:11)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR.
(Deuterons) (Nuclear reactions)

ALEKSANDROV Yu. A.

AUTHOR: ALEKSANDROV, Yu.A. 56-7-56/66

TITLE: The Scattering of Fast Neutrons on Heavy Nuolei at Small Angles. (Rasseyaniye bystrykh neytronov tyazhelymi yadrami na malyye ugly, Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 33, Nr 7, pp 294-296 (U.S.S.R.)

ABSTRACT: The angular distribution of elastically scattered fast neutrons on the nuolei Pu, U, Pb, Bi, Sn, Cu is recorded in form of a curve, where $d\sigma/d\Omega$ in b/sterad is plotted as an ordinate, and cos θ as an abscissa. The scattering angles are located in an interval of 4-25°. The results for the domain 0,7 - 5° will be published at a later date. (With 3 Illustrations and 2 Slavic Reference).

ASSOCIATION: Institute for Atomic Energy. (Institut atomnoy energii)

PRESENTED BY:

SUBMITTED: 10.4.1957

AVAILABLE: Library of Congress

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ALEKSANDROV YU.A.

AUTHORS: Aleksandrov, Yu.A., Delone, N.B., Slovokhotov, L.I. 56-3-11/59
Sokol, G.A., Shtarkov, L.N.

TITLE: The Photodisintegration of the Deuteron at Energies from 5o to 15o MeV (Fotorasshchepleniye deytona pri energiyakh ot 5o do 15o MeV)

PERIODICAL: Zhur. Eksptl'. i Teoret. Fiz., 33, 614-20, 1957.

In the 265 MeV synchrotron of the F.I.A.N. the photodisintegration was measured in D_2O and H_2O preparations by recording the protons in a telescope consisting of 2 proportional recording tubes. For the γ-energies of 54, 7o, 88, 11o, 129, 148 MeV the differential effective cross sections were measured at the following angles: 22,5; 45;, 67?5; 9o; 112,5; 135; 157,5° and diagrammatically recorded. There are 3 figures and 2 tables.

ASSOCIATION: Physics Institute im. P.N. Lebedev, USSR Academy of Sciences (Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR)

SUBMITTED: March 27, 1957.

AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Aleksandrov, Yu. A. SOV/48-22-7-14/26

TITLE: Investigation of Cs^{134} by the Coincidence Method (Issledovaniye Cs^{134} metodom sovpadeniy)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol. 22, Nr 7, pp. 827-830 (USSR)

ABSTRACT: In order to achieve a precise definition of the decay scheme, further investigations of the γ-γ and β-γ coincidences were conducted. The measurements were taken by means of luminescence spectrometers. They were connected with a coincidence circuit with a resolution of 2.10^{-7} sec. The coincidence spectra with the γ-lines of 605, 797, 1170 and 1370 keV were investigated. The experimental evidence substantiated the existence of the transitions from 605-797, 605-1370, 605-570, 797-570 and 1170-802(797) keV. Also the cascade transitions from 605-1040 and 1170-475 keV were demonstrated. The transition from 605-475 keV was not found. The analysis of the coincidence spectrum shows that the hard part of the β-spectrum coincides to a higher extent with the γ-line of 797 keV than with the line of 605 keV. This agrees with results from reference 10.

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Investigation of Cs^{134} by the Coincidence Method SOV/48-22-7-14/26

In this paper the hard range of the γ-spectrum of Cs^{134} was investigated. The photo peaks of the γ-rays of 164o, 175o, 187o, 196o and 2o4o keV were confirmed to exist. The intensity of all γ-lines is of the order of 10^{-6} quanta per decay. The experimental data obtained concerning the γ-γ coincidences and the measurement of the hard part of the γ-spectrum of Cs^{134} do not contradict the decay scheme given by Foster (Foster) and Wiggins (Ref 6) with respect to the hard γ-transitions as given in reference 13. Only the transition at 475 keV according to these measurements takes place between the levels of 1644 and 1168 keV and not between the levels of 187o and 1368 keV (Ref 6). From the results concerning the β-γ-coincidences it can be concluded that part of the γ-transitions with 137o keV leads to the ground state of Ba^{134}. The quantal characteristic of the level of 137o keV is 3^-. The γ-transition at 137o keV must be of a E3-type. The existence of the γ-γ coincidences 137o-6o5 keV leads to the assumption that a second transition at 137o keV or another at 6o5 keV exists. The first assumption is more probable. The Diplomant S. V. Golenetskiy assisted in the work. There are 5 figures and 13 references, 1 of which is Soviet.

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Investigation of Cs^{134} by the Coincidence Method SOV/48-22-7-14/26

ASSOCIATION: Leningradskiy gos. universitet im. A. A. Zhdanova
(Leningrad State University imeni A. A. Zhdanov)

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24(0) SOV/56-35-5-48/56

AUTHORS: Aleksandrov, Y[illegible] A[illegible] Andreyev, V. N., Bondarenko, I. I.

TITLE: On the Pr[illegible] o [illegible]ntigravitation (K voprosu ob antigravitatsii)

PERIODICAL: [illegible]urnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 5, pp 1305-1306 (USSR)

ABSTRACT: In connection with the discovery of heavy antiparticles (antiproton and antineutron) the [illegible]inion was expressed in several papers that antiparticles have a negative gravitation mass (Refs 1, 2[illegible]). S[illegible]a hypothesis might explain the absence of [illegible]icles in our stellar system and in its neighborho[illegible] because gravitational repulsion of matter and anti-matter would warrant their spatial separation. The authors in short discuss the extent to which the hypothesis of antigravitation agrees with present physical theories and experimentally established facts. 1) According to experimental data concerning the deflection of positrons and antipositrons in a magnetic field, the inert mass of antiparticles is positive. According to present notions, the physical phenomena in a totality of antiparticles must develop in the same manner as in a totality of ordinary particles. Accordingly, the inert masses of particles and antiparticles would be bound

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to have the same (i.e. a positive) sign. This tends to show that the inert mass of antiparticles must be positive. In this case the hypothesis of a negative gravitation mass of antiparticles is apparently in contradiction to the general relativity (principle of equivalence). 2) The assumption that the gravitation mass of antiparticles is negative would lead to additional difficulties in connection with the existence of bosons. 3) To assume the existence of an antigravitation would necessitate radical changes of present physical notions. Direct experimental determination of the sign of the gravitation mass of antiparticles (e.g. by observing the "falling" of positrons in the gravitational field of the earth) would be most desirable. The authors thank Professor D. I. Blokhintsov and F. L. Shapiro for useful discussions. There are 4 references.

SUBMITTED: July 16, 1958

ANDRE[illegible]V, Yu. A.: Master Phys-Math Sci (diss) -- "A study of the diffusion of [illegible]peed neutrons at small angles". Moscow, 1959. 12 pp (KL, No 13, 1959, 99)

ALEKSANDROV, Yu.A., SOLDATOV, A. S., ANIKIN, G. V.,

"Fast Neutron Spectrometry by Means of a Hydrogen Chamber."

paper presented at the Symposium of the International Atomic Energy Agency on Pile Neutron Research in Physics, Vienna, 17-21 Oct 1960.

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S/120/60/000/01/034/051
E032/E314

AUTHORS: Aleksandrov, Yu.A., Gorbunkov, V.M., Delone, N.B. and Likhachev, V.M.

TITLE: On the Formation of Image in Bubble-chamber Track Photography

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 1, pp 113 - 114 (USSR)

ABSTRACT: The bubbles which form the particle tracks in a bubble chamber are light scattering irregularities. They may be looked upon as spherical lenses having a refractive index which is different from that of the surrounding medium. The optical properties of such irregularities are determined by their relative refractive index and radius of curvature (Ref 1). In a bubble chamber, the refractive index of the liquid is greater than that of the bubble and, therefore, the latter behaves as a negative lens. The incident light is therefore refracted in the bubble and produces a virtual image of the source of light near the image of this "lens". Rays refracted by the lens and entering the objective of the photographic camera produce an image, not of the

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On the Formation of Image in Bubble-chamber Track Photography

bubble, but the virtual source which lies near the focus of the bubble. It is therefore of interest to consider the effect of the difference in the position of the bubbles and the corresponding images of the source of light. For paraxial rays incident from infinity the distance from the centre of the spherical lens of radius R to the image is given by:

$$f' = \frac{1}{2} Rn_2/\Delta n$$

where Δn is the difference between the refractive indices of the liquid and the bubble. Each point of the source of light is imaged near the focus of the spherical lens, and the entire source is imaged with a magnification given by $\beta \cong f'/L$ where L is the distance from the source of light to the bubble. Clearly, in the case of bubble chambers and particularly in the case of liquid-hydrogen bubble chambers in which Δn is small, the spatial separation of the bubbles and the images of the light sources will be very small. It has

On the Formation of Image in Bubble-chamber Track Photography

been found with the aid of a model that aberration and diffraction effects are negligible. A large-scale photograph was taken of bubbles in a propane chamber using the apparatus shown in Figure 1. The illuminating system consists of a source of light S , an opaque screen A and a diffuse reflector B . Figure 2 shows photographs of electron tracks in the propane bubble chamber. The electrons were due to Co^{60} sources. In Figure 2, photograph (a) was obtained with a single source (a small hole in a screen); (б) with two holes; (в) with three holes; (г) and (д) with a ring source. From a knowledge of the geometry of the experiment it was possible to estimate the diameters of the bubbles. They were found to be between 0.1 and 0.4 mm, depending on illumination conditions. It is concluded that the recorded bubbles are in fact images of the source of light. The spatial displacement of the image of the source relative to the centre of the bubble is not small. Thus, in the case of liquid hydrogen the quantity f' is

On the Formation of Image in Bubble-chamber Track Photography

approximately equal to 6R . Acknowledgment is made to G.G. Slyusarev for valuable discussions.
There are 2 figures and 1 Soviet reference.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physical Institute of the Ac.Sc., USSR)

SUBMITTED: November 20, 1958

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86756

S/120/60/000/006/032/045
E032/E314

21.5200 (1033, 1144, 1191)

AUTHORS: Aleksandrov, Yu.A., Delone, N.B., Likhachev, V.M. and Gorbunkov, V.M.

TITLE: Formation of the Image in the Photography of Bubble-chamber Tracks

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No. 6, pp. 118 - 119

TEXT: It was shown in Ref. 1 that when bubble-chamber tracks are photographed, the object which is actually photographed is the virtual image of the source in the bubbles. The refractive index of the vapour in the bubble is smaller than the refractive index of the surrounding liquid and hence the bubble is divided into two zones. The bubble constitutes a negative lens for rays incident at angles smaller than the angle of the total internal reflection, and a convex spherical mirror for rays incident at angles greater than the angle of total internal reflection. This is illustrated in Fig. 1. The point source S_o is located at infinity on the left of

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E032/E314

Formation of the Image in the Photography of Bubble-chamber Tracks

the bubble. The ray 1 is refracted, while the ray 2 is reflected. Intermediate rays having angles of incidence $i_1(i_2)$ have the corresponding values of $h_1(h_2)$ and $\varphi_1(\varphi_2)$. They form virtual images $S'_{01}(S'_{02})$ of the source S_o on the axis $S_o O$. Both for the refracted and reflected rays we have

$$h_{1|(2)} = r \sin i_{1(2)}, \quad h_{1(2)} = H_{1|(2)}$$

while for the refracted rays we have

$$\varphi_1 = 2(i'_1 - i_1) \quad \text{and} \quad n_{\text{air}} \sin i_1 = n_{\text{H}} \sin i'_1$$

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Formation of the Image in the Photography of Bubble-chamber Tracks

where $n_ж$ is the refractive index of the liquid and

$n_п$ is the refractive index of the vapour.

For the reflected rays $\varphi_2 = 2(90^\circ - i_2)$. The objective of the photographic camera receives a narrow pencil of rays whose aperture is defined by the diameter of the entrance pupil of the objective and the distance to the working volume of the camera. For an objective with a focal length of 50 mm, a relative power of 1:20 and a distance to the working volume of 500 mm, the aperture of the pencil is about 0.5°. It follows that the image formed by the objective is due only to a very narrow pencil of rays. Such a pencil will experience only paraxial aberrations, i.e. astigmatism and distortion. In order to confirm the above theory of image formation, an experiment was carried out using two sources of light located symmetrically with respect to the objective-bubble axis. In this geometry each bubble forms four virtual images, two of

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Formation of the Image in the Photography of Bubble-chamber Tracks

which are produced by the refracting zone and two by the reflecting zone. The distance between each corresponding pair of images, which is equal to $2H_1$ and $2H_2$ in the two cases, respectively, depends on the radius of the bubble. For all bubbles, $2H_2$ is determined by the relative refractive index of the liquid and the vapour $n_{ж}/n_{п}$.

In the experiment, an objective having a focal length of 240 mm and a relative power of 1:16 was employed. It was found that the above theory describes the experimentally obtained results to a high degree of accuracy.

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E032/E314

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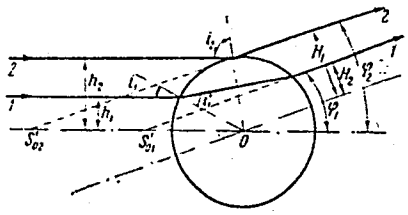

There are 2 figures and 1 Soviet reference.

ASSOCIATIONS: Fizicheskiy institut AN SSSR (Physics Institute of the AS USSR) Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physico-technical Institute)

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86756

S/120/60/000/006/032/045
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Formation of the Image in the Photography of Bubble-chamber Tracks

SUBMITTED: September 29, 1959

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86757

S/120/60/000/006/033/045
E032/E314

21.5200 (1033, 1144, 1191)

AUTHORS: Aleksandrov, Yu.A., Delone, N.B., Likhachev, V.M. and Gorbunkov, V.M.

TITLE: On the Rate of Growth and the Rate of Upward Drift of Bubbles in a Propane Chamber

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No. 6, p. 120

TEXT: It was shown in previous papers by the present authors (Refs. 1, 2) that when particle tracks in bubble chambers are photographed, the object which is photographed is the virtual image of the source in the bubbles. The experiment described in Ref. 2, in which two sources of illumination were employed will also provide information about the rate of growth and the rate of upward drift of bubbles. The experiments reported in the present note were similar to those described in Ref. 2 (see the previous abstract of this issue), except for the sources of illumination. Two pulsed lamps were used to illuminate the two sources using a delay of 7, 14, 22 and 30 μs, respectively. A photograph of two

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On the Rate of Growth and the Rate of Upward Drift of Bubbles in a Propane Chamber

successive flashes of the lamps was obtained on each plate. During the time between the flashes each bubble increases in size and drifts upwards. The growth of the bubble leads to an increase in the distance between the dots in the horizontal direction, while the upward drift leads to a displacement of the dots in the vertical direction. A typical photograph is shown in Fig. 1. The radius of the bubbles was measured by the method described in Ref. 2. In the four series of measurements which were carried out the initial radius was between 0.1 and 0.2 mm and the final radius between 0.2 and 0.36 mm. According to Seitz (Ref. 3), the radius in mm is related to the time in sec by the formula $r = Ct^{1/2}$. The value obtained for the constant is : $C_{exp} = (5.8^{+2.6}_{-1.2})10^{-2}$.

S/120/60/000/006/033/045
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On the Rate of Growth and the Rate of Upward Drift of Bubbles in a Propane Chamber

The errors indicated represent maximum deviations. According to Plesset and Zwick (Ref. 4), the constant C for propane has the theoretical value of 0.17. The rate of upward drift for the above range of bubble radii was found to be 0.036 and 0.117 mm/sec. It is clear that the rate of upward drift is appreciably greater than the rate of growth of the bubbles, i.e. during its growth each bubble is displaced through the surrounding medium. This fact was not taken into account by Seitz (Ref. 3). The heat exchange between the bubble of liquid, which determines its rate of growth, will be greater in the case of a moving bubble. This will lead, in the case of the present experiment, to a discrepancy between experiment and theory, as indicated above. Further work is being carried out in this connection.

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E032/E314

On the Rate of Growth and the Rate of Upward Drift of Bubbles in a Propane Chamber

There are 1 figure and 4 references: 2 Soviet and 2 English.

ASSOCIATIONS: Fizicheskiy institut AN SSSR
(Physics Institute of the AS USSR)
Moskovskiy fiziko-tekhnicheskiy institut
(Moscow Physico-technical Institute)

SUBMITTED: September 29, 1959

Card 4/4

ALEKSANDROV, Yu.A.; NEMILOV, Yu.A.; NIKITIN, M.K.; PISKORZH, Sh.

Investigating the decay scheme of Eu^{147}. Izv.AN SSSR.Ser.fiz. 24 no.9:1099-1104 S '60. (MIRA 13:9)

1. Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A. Zhdanova.
(Europium--Decay)

ALEKSANDROV, Y. A., ARISTARKHOV, N. N., BONDARENKO, I. I., KRASNOYAROV, N. I.,
MOROZOV, V. N., NIKOLAYEV, N. K., PINKHASIK, M. S., SMIRENKIN, G. N.,
STAVISSKIY, Y. Y., SALMIKOV, O. A., UKRAINTSEV, F. I., USACHEV, L. N.,
LEYPUNSKIY, A. I., KAZACHKOVSKIY O. D., ABRAMOV, A. I.,

Physical charactistiss of the BR-5 reactor

report submitted for the IAEA Seminar on the Physics of Fast and Intermediate Reactors, Vienna, 3-11 August 1961
(report presented by G. I. Marchuk)

Acad, Sci. USSR, Moscow

21406
S/089/61/011/006/002/014
B102/B138

21.1000

AUTHORS: Leypunskiy, A. I., Abramov, A. I., Aleksandrov, Yu. A., Anikin, G. V., Bondarenko, I. I., Guseynov, A. G., Ivanov, V. I., Kazachkovskiy, O. D., Kuznetsov, V. F., Kuz'minov, B. D., Morozov, V. N., Nikolayev, M. N., Sal'nikov, O. A., Smirenkin, G. N., Soldatov, A. S., Usachev, L. N., Yutkin, M. G.

TITLE: Investigation of the BR-5 (BR-5) fast reactor (spatial and energy distributions of neutrons)

PERIODICAL: Atomnaya energiya, v. 11, no. 6, 1961, 498 - 505

TEXT: The fast research reactor BR-5 and its experimental equipment is described in brief and some of its neutron spectra are given and discussed. The following data are given: fuel - plutonium oxide; coolant - sodium; reflector - thin layer of natural uranium plus thick layer of nickel: power - 5000 kw. The reactor has many vertical and horizontal holes for technical and physical studies and is well supplied with experimental equipment. Leypunskiy gave a detailed description of the BR-5 reactor at

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Investigation of the...

the Second Geneva Conference (1958). Inside the core the neutrons have energies of more than 100 kev which they lose almost completely in passage through reflector and shield. In the outer layers of the shield, their mean energy does not exceed some tens of ev. In the kev range ($E_n > 50$ kev) spectra were measured for the most important beams and channels. For the other cases, they were determined from threshold reactions. The soft part of the spectrum within the reflector was determined from the spatial distribution of neutrons with $E_n \simeq 5$ ev, recorded with gold resonance indicators. The total neutron flux was determined only at the points where the Pu^{239} fission cross section was constant. Direct neutron spectrum measurements were carried out in a vertical (OK-70) and a horizontal (B-3) channel using (He^3+Ar)-filled ionization chamber in the first case and the neutron transmission method with n-hexane in the second. The neutron spectrum of the horizontal channel was also determined by photoemulsions. From the rates of indicator and fission reactions $Au^{197}(n,\gamma)$, $U^{235}(n,f)$ $Pu^{239}(n,f)$, $Th^{232}(n,f)$, $Na^{23}(n,\gamma)$ $Cu^{63}(n,\gamma)$, and $Al^{27}(n,\alpha)$ the abrupt

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Investigation of the...

drop in neutron energy in the Ni reflector was determined, and the activity caused by resonance neutrons (E_n = 4.9 ev). The fast neutron flux ($E_n > 1.4$ Mev) in the core center was found to be $(2.4 \pm 0.2) \cdot 10^{14}$, and total flux was $(8.2 \pm 0.3) \cdot 10^{14}$. Experimental results were verified by energy-group calculations (18 groups). Good agreement between theory and experiment was also found for the channel spectra. The authors thank D. S. Pinkhasik, N. N. Aristarkhov, and the reactor personnel for assistance. There are 10 figures, 2 tables, and 2 Soviet references.

SUBMITTED: August 17, 1961

Table 1. Reaction cross sections in the core center.

Legend: (1) Reaction; (2) experiment; (3) σ calculated, given in barns.

Fig. 7. Neutron transmission spectrum (n-hexane) for the horizontal channel B-3.

X

Card 3/3

ALEKSANDROV, Yu.A.; NIKITIN, M.K.

Investigation of the decay chain of Eu^{145}. Izv. AN SSSR. Ser. fiz. 25 no.9:1176-1177 '61. (MIRA 14:8)

1. Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A.A. Zhdanova.
(Europium—Decay)

ALEKSANDROV, Yu.A.; ANIKIN, G.V.; SOLDATOV, A.S.

Scattering of 0.8 and 2.8 Mev. neutrons in the region of small argles. Zhur. eksp. i teor. fiz. 40 no.6:1878-1879 Je '61.
(MIRA 14:8)

(Neutrons--Scattering)

39148
S/120/62/000/003/007/048
E032/E114

21600

AUTHORS: Aleksandrov, Yu.A., Voronov, G.S., and Delone, N.B.

TITLE: The rise of bubbles and distortion of tracks in bubble chambers

PERIODICAL: Pribory i tekhnika eksperimenta, no.3, 1962, 50-51

TEXT: In a previous paper (Yu.A. Aleksandrov, N.B. Delone, V.M. Likhachev, V.M. Gorbunkov, PTE, no.6, 1960, 120) it was shown that as the bubbles forming the track expand, they float up through a distance which is considerably greater than their radius, and this gives rise to a displacement of the tracks. In the present note the authors make use of their theory of the growth of bubbles (FIAN, A-131, 1961) to calculate this displacement and estimate the distortion of tracks. Explicit formulae are given which may be used to compute these effects. In a typical hydrogen chamber (N.C. Barford, Progr. in Cryog., 2, 1960, 88) a spurious radius of curvature due to unequal displacement of tracks along their lengths was found to be of the order of 20 m. The distortion may be reduced either by ensuring that the bubbles

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have sufficiently small radii, or by increasing the rate of growth of the bubbles. In practice it is always possible to reduce the distortion by a suitable choice of the working parameters.

ASSOCIATION: Fizicheskiy institut AN SSSR
(Physics Institute, AS USSR)

SUBMITTED: June 5, 1961

Card 2/2

ALEKSANDROV, Yu.A.; NECHAYEV, Yu.I.

Radioactive source of pulse radiation. Prib. i tekh. eksp. 7 no.2:168-169 Mr-Ap '62. (MIRA 15:5)

1. Fizicheskiy institut AN SSSR.
(Radioisotopes) (Gamma rays)

ALEKSANDROV, Yu.A.; VORONOV, G.S.; DELONE, N.B.

Floating up of bubbles and distortion of paths in bubble chambers.
Prib. i tekh. eksp. 7 no.3:50-51 My-Je '62. (MIRA 16:7)

1. Fizicheskiy institut AN SSSR.
(Bubble chamber)

S/048/62/026/009/005/011
B125/B186

AUTHORS: Aleksandrov, Yu. A., and Nemer, B.

TITLE: Measurement of the angular correlations of cascade γ-transitions in Eu^{145} and Eu^{147} decay

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 9, 1962, 1159-1161

TEXT: The angular correlations of the cascade γ-transitions with 110 and 895 kev (with 77 to 121 kev and 121 to 676 kev) caused by the decay of Eu^{145} (Eu^{147}) were measured with a scintillation spectrometer at 90, 135, and 180° between the axes of the counters. The europium preparation was separated from a tantalum target after irradiation with 660-Mev protons. Agreement was obtained between the experimentally determined and the theoretically calculated correlation functions

110—895 keV: $W(\theta)=1+(0,14\pm0,08)P_2(\cos\theta)-(0,05\pm0,06)P_4(\cos\theta)$;
77—121 keV: $W(\theta)=1+(0,05\pm0,03)P_2(\cos\theta)+(0,10\pm0,07)P_4(\cos\theta)$;
121—676 keV: $W(\theta)=1+(0,06\pm0,04)P_2(\cos\theta)+(0,05\pm0,06)P_4(\cos\theta)$.

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if the order 1/2(1,2),3/2(2)7/2 holds for the spins of the excited states and the multipolarities of the transitions in Sm^{145} (0-895-1005). The 895-kev (110 kev) γ-transition is of type E2(M1+E2). The analogous order for Sm^{147} (ground state) is 3/2(1,2).5/2(1,2).7/2 (for 0-121-198 kev) and 3/2(1,2).5/2(1,2).7/2 for 0-121-797 kev. The deviations from the results of Aleksandrov Yu. A. et al.(Izv. AN SSSR. Ser. fiz., 24, No. 9, 1099 (1960) might be due to the scattering from one counter into another. Since the 895-kev transition is an E_2 transition to the ground state, the 895-kev level is most probably a vibrational one. There is a figure, which shows the schemes of the excited states of the Sm^{145} and Sm^{147} nuclei. There is 1 figure.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova (Scientific Research Physics Institute of the Leningrad State University imeni A. A. Zhdanov)

Measurement of the angular correlations...

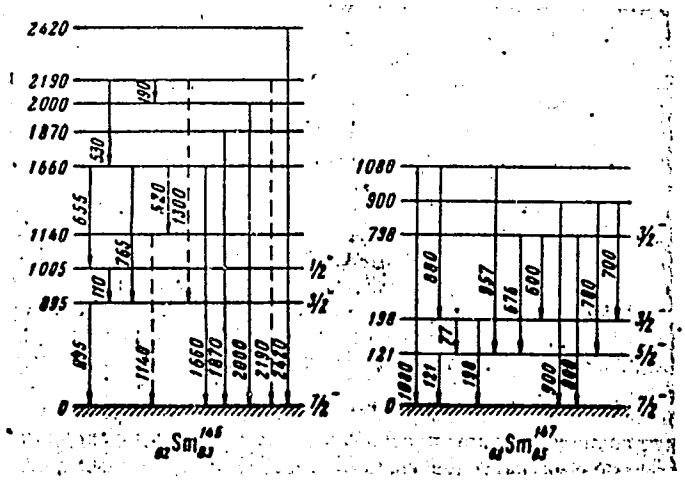

Fig.

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ALEKSANDROV, Yu.A.; VORONOV, G.S.; DELONE, N.B.

The sensitivity of fluids to radiation. Zhur. eksp. i teor. fiz. 43 no.4:1552-1554 O '62. (MIRA 15:11)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR.
(Bubble chamber) (Cobalt--Isotopes)

ALEKSANDROV, YU. A.

" New bubble chamber operating conditions."

" The bubble size measurement in the bubble chamber."

report submitted for the 1962 International Conference on Instrumentation for High Energy Physics at Cern, Geneva, 16-18 July 1962

ALEKSANDROV, Yu.A.; VORONOV, G.S.; GORBUNKOV, V.M.; DELONE, N.B.; NECHAYEV, Yu.I.; MATVEYEVA, A.V., red.; POPOVA, S.M., tekhn. red.

[Bubble chambers] Puzyr'kovye kamery. [By] IU.A.Aleksandrov i dr. Moskva, Gosatomizdat, 1963. 339 p. (MIRA 17:1)

L 11396-63 EWT(m)/BDS AFFTC/ASD

S/120/63/000/002/008/041

AUTHOR: Aleksandrov, Yu. A., Voronov, G. S., amd Delone, N. B.

TITLE: Growth and condensation of bubbles in bubble chambers

PERIODICAL: Pribory i tekhnika eksperimenta, March-April 1963, v. 8, no. 2, 41-44

TEXT: The article discusses growth and condensation of vapor bubbles in a superheated liquid in order to account for flotation effects. It is shown that flotation effects substantially influence the rates of growth and condensation. Formulas are derived for the growth rate, the time dependence of the radius, the time necessary for condensation, and the heat dissipation. These formulas are used to analyze the processes necessary for resetting the chamber to initial conditions and the efficiency of chamber operation in registering rare random events. There are two figures.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute, Academy of Sciences USSR)

SUBMITTED: June 18, 1962

Card 1/1 ja/CA

ÆLEKSANDROV, Yu.A.; VORONOV, G.S.; DELONE, N.B.

Measuring the rate of growth of bubbles in a propane chamber.
Prib. i tekh. eksp. 8 no.3:62-63 My-Je '63. (MIRA 16:9)

1. Fizicheskiy institut AN SSSR.
(Bubble chamber)

ALEKSANDROV, Yu.A.; DELONE, N.B.

Measuring the radiosensitivity zone boundary for propane. Prib. i tekh. eksp. 8 no.3:64-65 My-Je '63. (MIRA 16:9)

1. Fizicheskiy institut AN SSSR.
(Bubble chamber) (Propane)

ALEKSANDROV, Yu. A.; RYABOV, Yu. V.; SAMOSVAT, G. S.

"Attempt to Determine the Parity of the Ground State of Pu^{239}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

OIYaI (Joint Inst Nuclear Res)

ALEKSANDROV, Yu.A.; KUTSENKO, A.V.; MAYKOV, V.N.; PAVLOVSKAYA, V.V.

Time characteristics of a Cherenkov spectrometer of total absorption. Prib.i tekhn.eksp. 10 no.5:45-48 S-O '65. (MIRA 19:1)

1. Fizicheskiy institut AN SSSR, Moskva. Submitted August 21, 1964.

L 21796-66 EWT(m)/EWP(j)/T WW/JW/WE/RM

ACC NR: AP6012646 SOURCE CODE: UR/0079/65/035/001/0115/0117

AUTHOR: Aleksandrov, Yu. A.; Shushunov, V. A.

ORG: none

TITLE: Organometallic peroxide compounds. V. Perhydrate of triethyltin hydroperoxide

SOURCE: Zhurnal obshchey khimii, v. 35, no. 1, 1965, 115-117

TOPIC TAGS: organometallic compound, peroxide, organic synthetic process, chemical decomposition

ABSTRACT: Triethyltin hydroperoxide, one of the least investigated organometallic peroxides, has been synthesized. Triethyltin oxide was reacted with hydrogen peroxide to obtain this compound. It can be assumed that in the synthesis of triethyltin peroxide the hydroxide and hydroperoxide of triethyltin are formed as intermediate products.

$$(C_2H_5)_3SnOSn(C_2H_5)_3 + H_2O_2 \rightarrow (E_2A_5)_3SnOH + (C_2H_5)_3SnOOH$$

$$(C_2H_5)_3SnOH + (C_2H_5)_3SnOOH \rightarrow (C_2H_5)_3SnOOSn\,(C_2H_5)_3 + H_2O$$

Triethyltin hydroxide must also react with hydrogen peroxide,

Card 1/2 UDC: 547.258.11+541.459

ACC NR: AP6012646

which has acidic properties.

$$(C_2H_5)_3SnOH + H_2O_2 \rightarrow (C_2H_5)_3SnOOH + H_2O$$

The perhydrate of triethyltin hydroperoxide slowly decomposes even at room temperatures. Decomposition of small amounts of this compound occurs at room temperature gradually and is accompanied by the formation of solid, liquid, and gaseous products. Only one of the thermal decomposition products has been investigated -- the oxyhydroperoxide of diethyltin $(C_2H_5)_2Sn(OH)OOH$. This product is a fine-crystalline compound, insoluble in organic solvents and exploding when heated to 150-180°. Orig. art. has: 5 formulas. [JPRS]

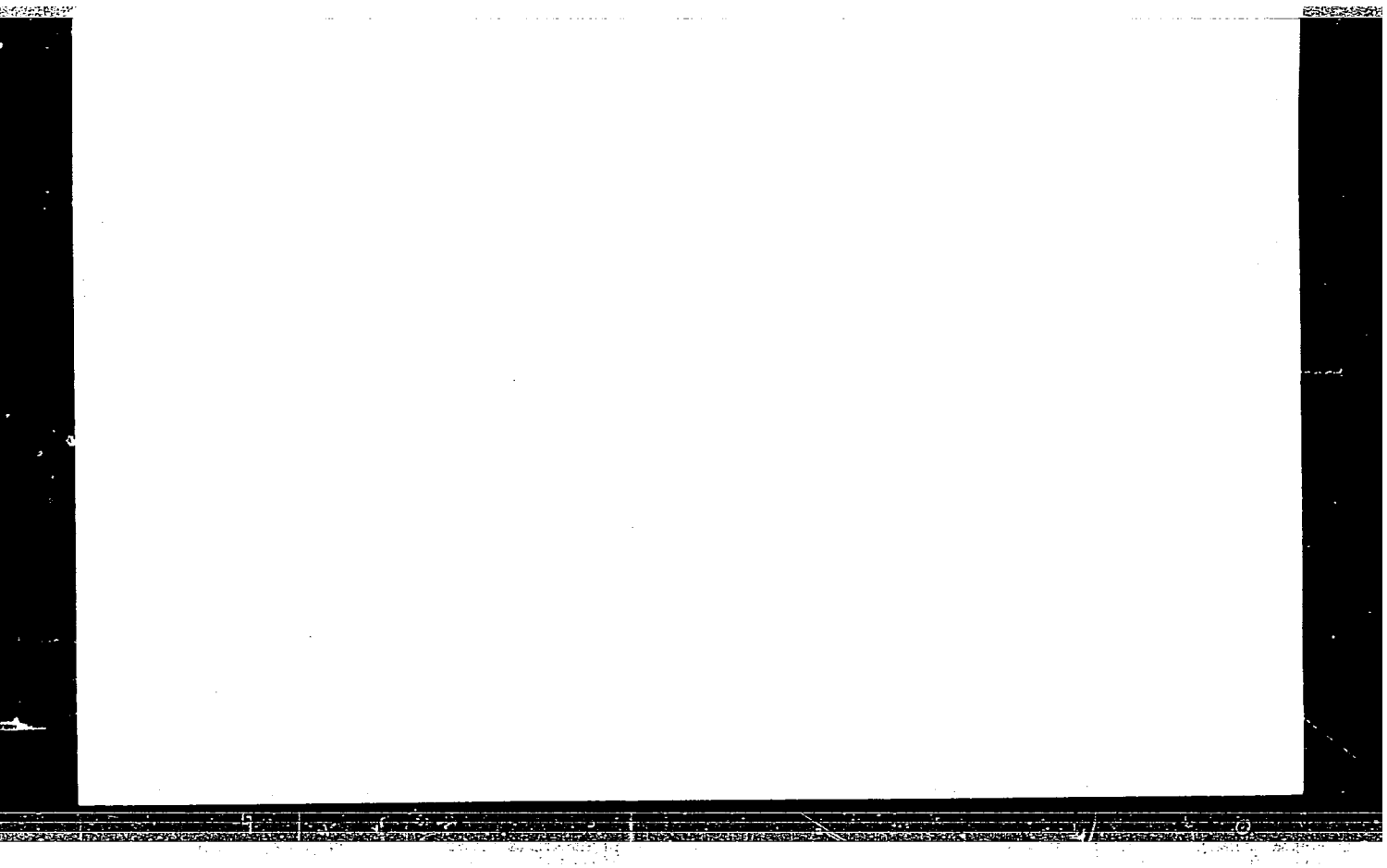
SUB CODE: 07 / SUBM DATE: 12Nov63 / ORIG REF: 004 / OTH REF: 001

Card 2/2

ALEKSANDROV, Yu.A.

"Belyi ugol'", 60th anniversary of the first Russian hydroelectric power station. Elek. sta. 34 no.9:95-96 S '63. (MIRA 16:10)

1. Glavnyy inzh. tresta "Kavminvodosvet".



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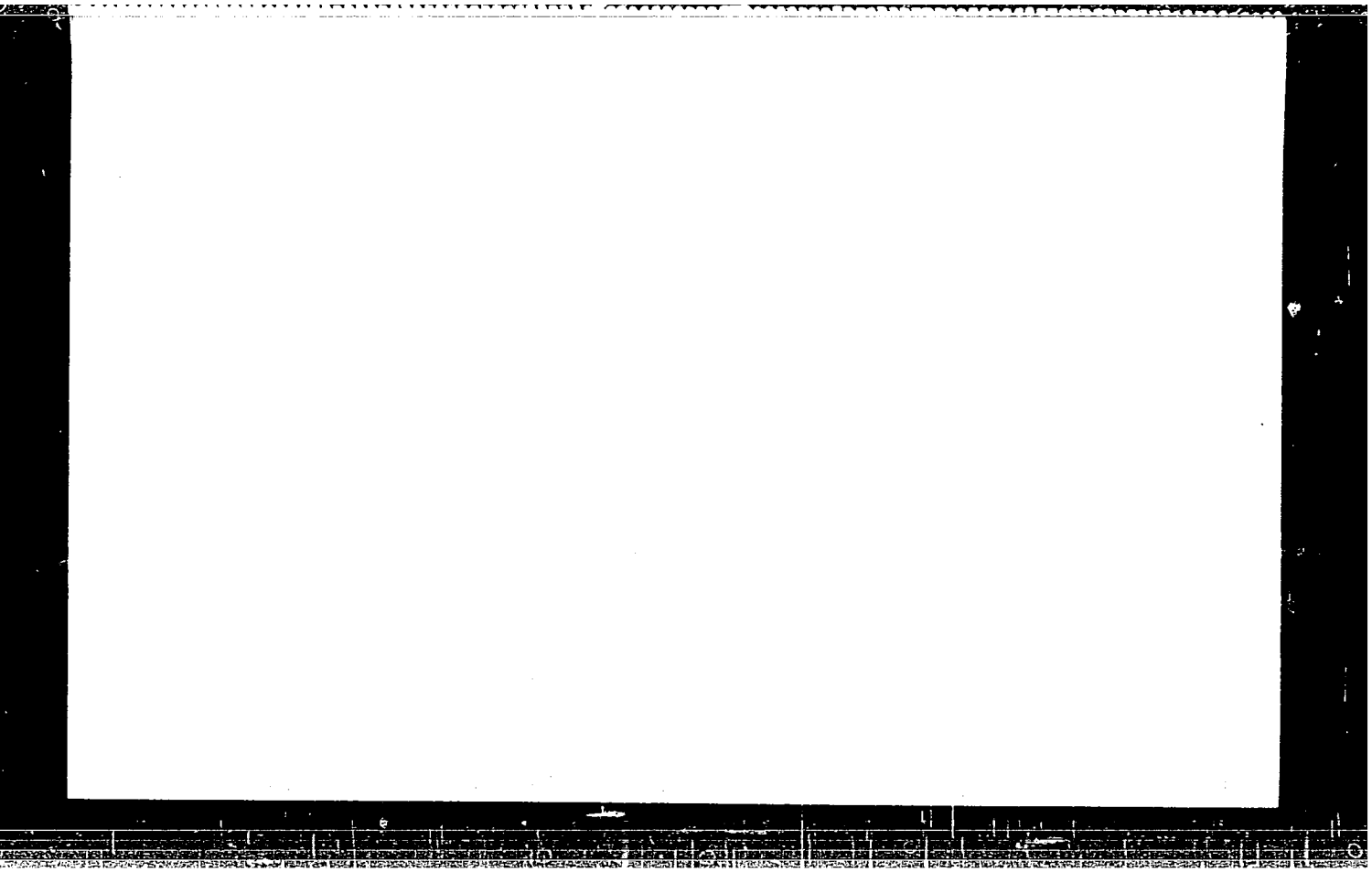

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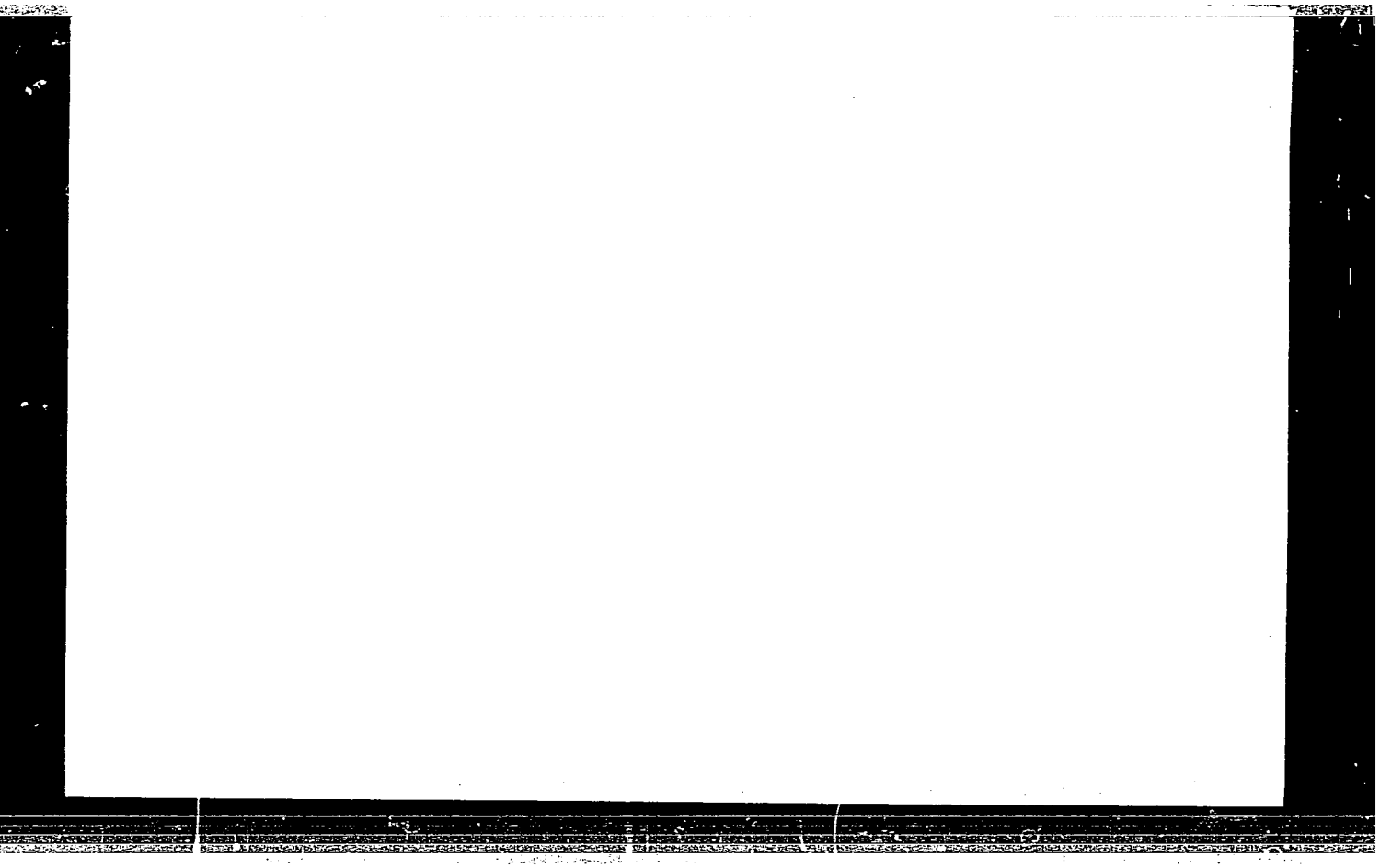

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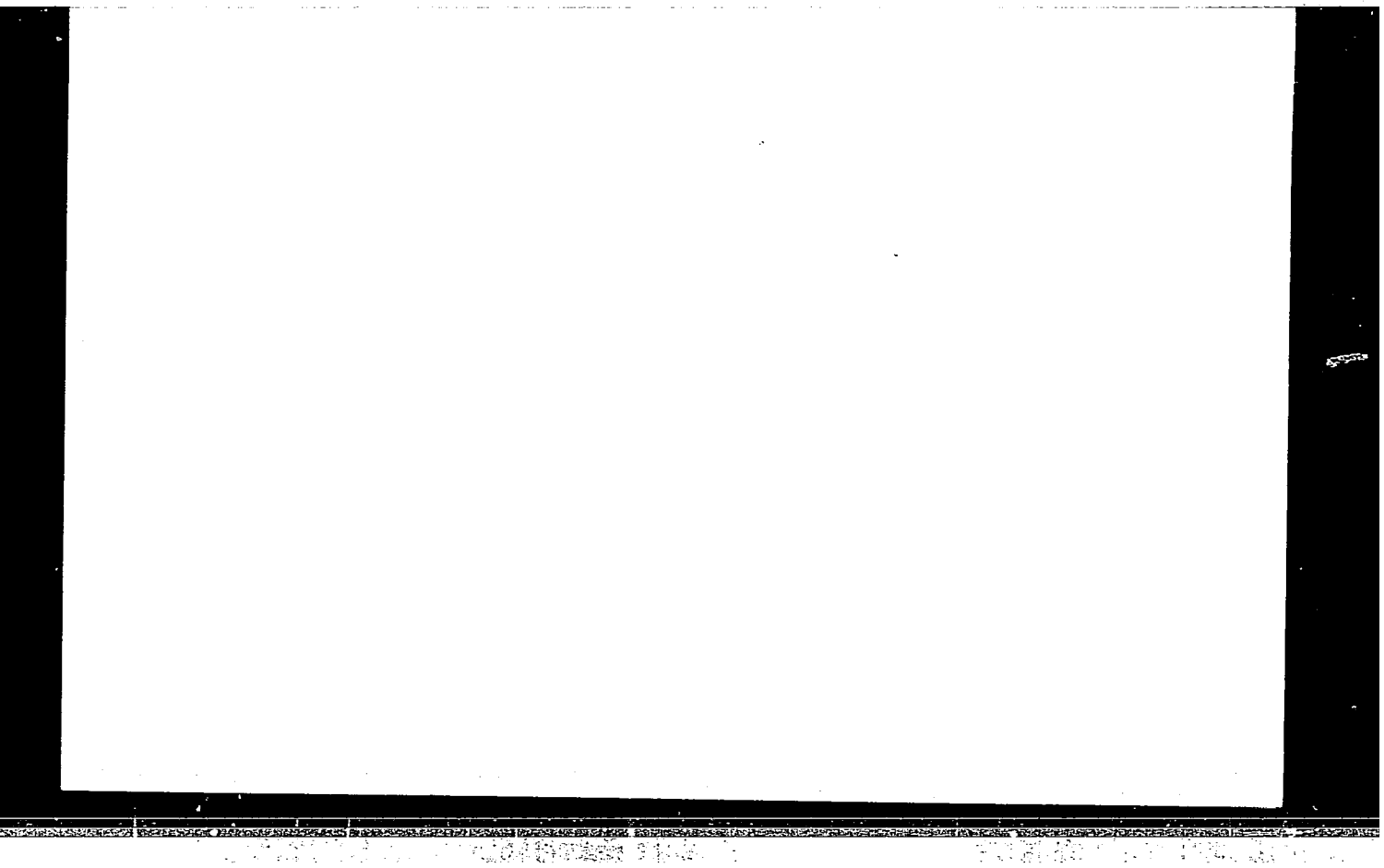

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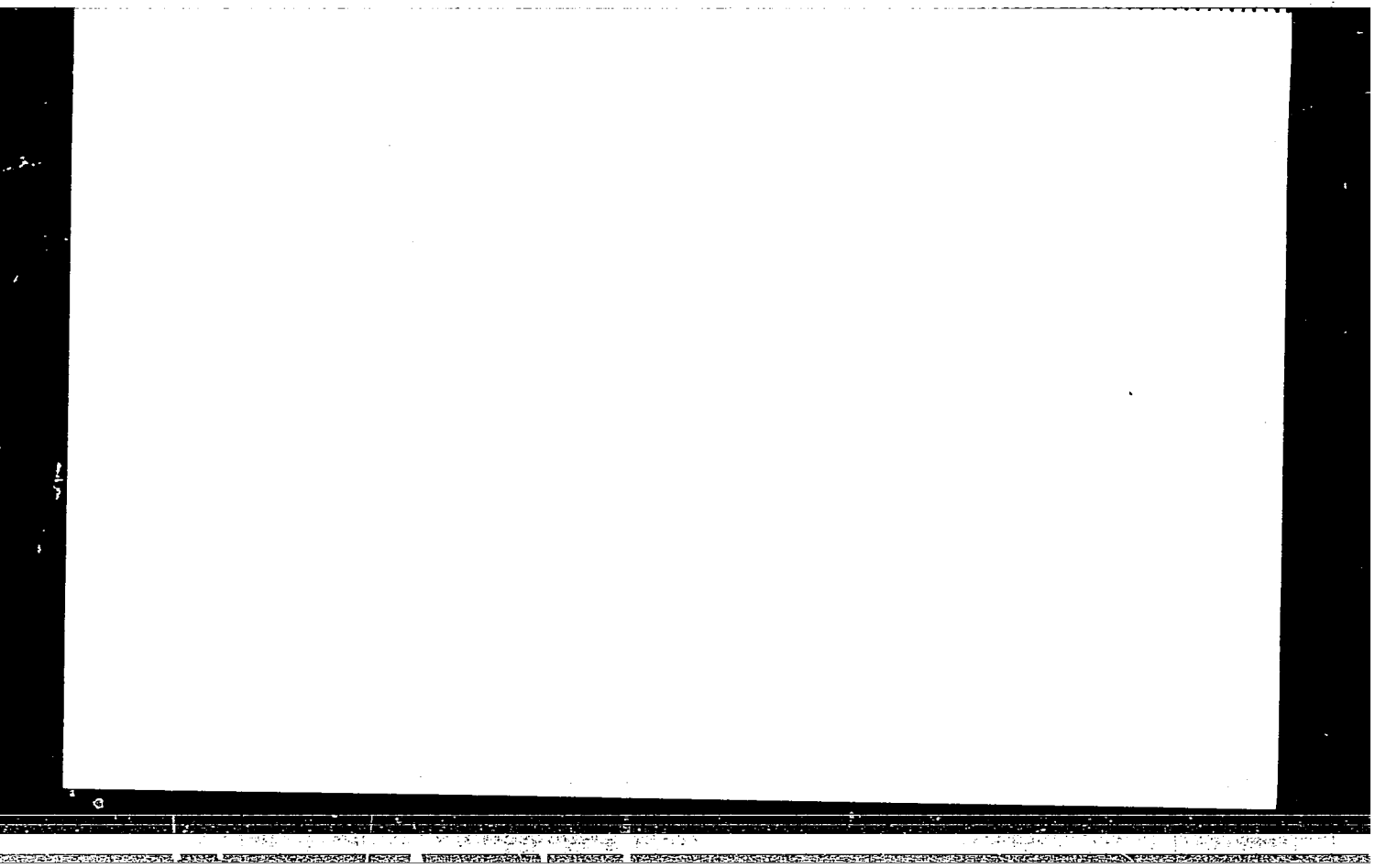

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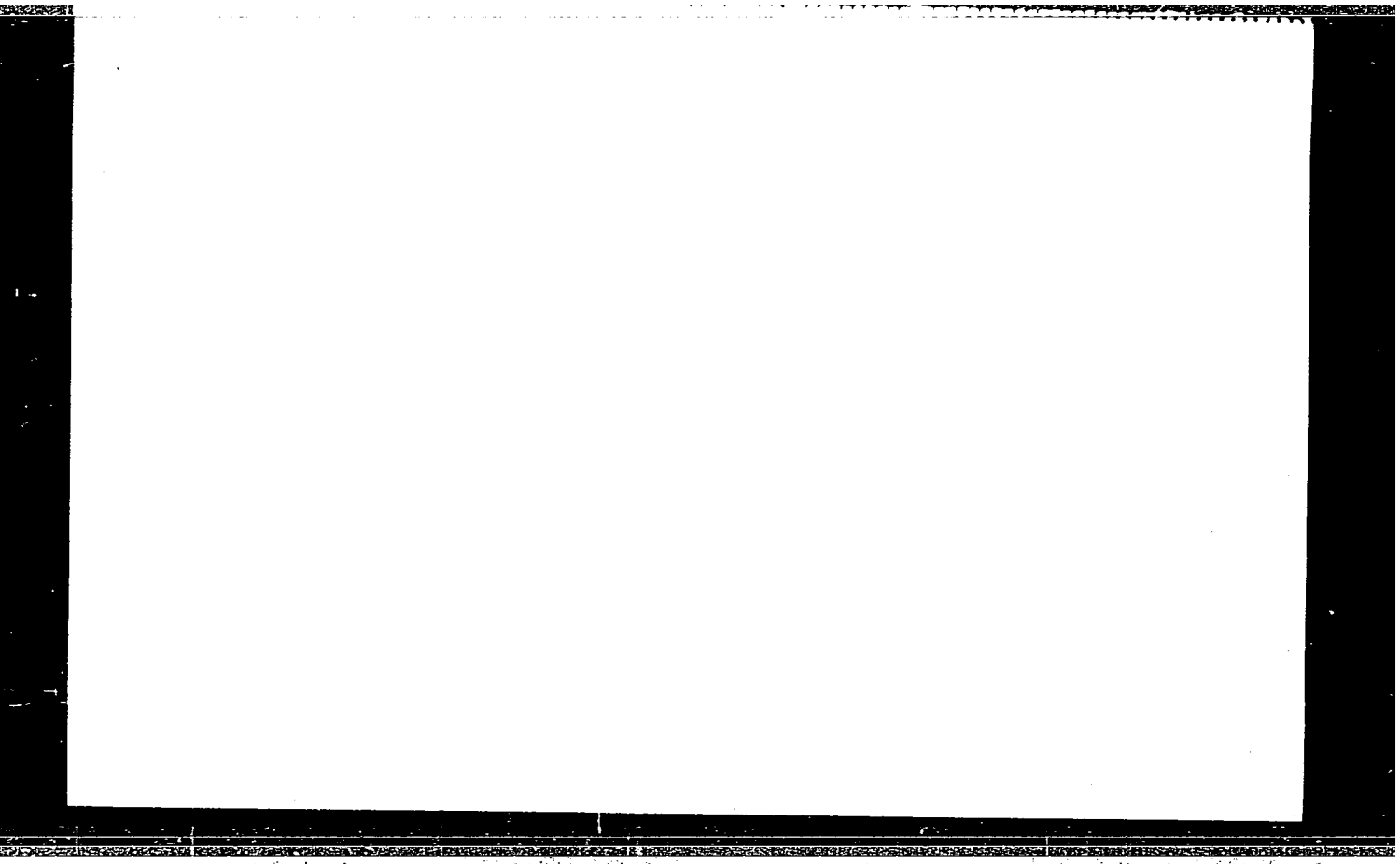

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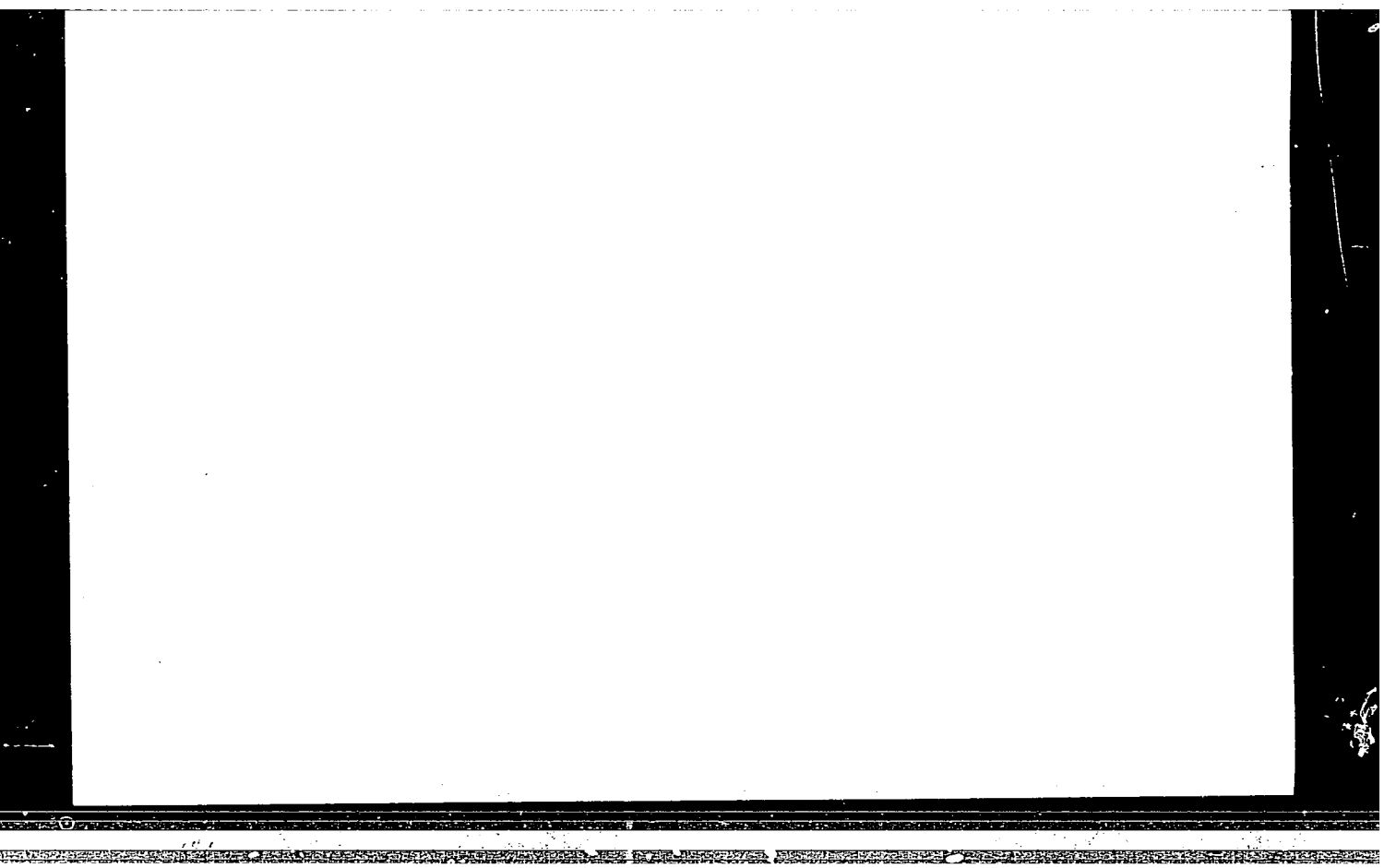

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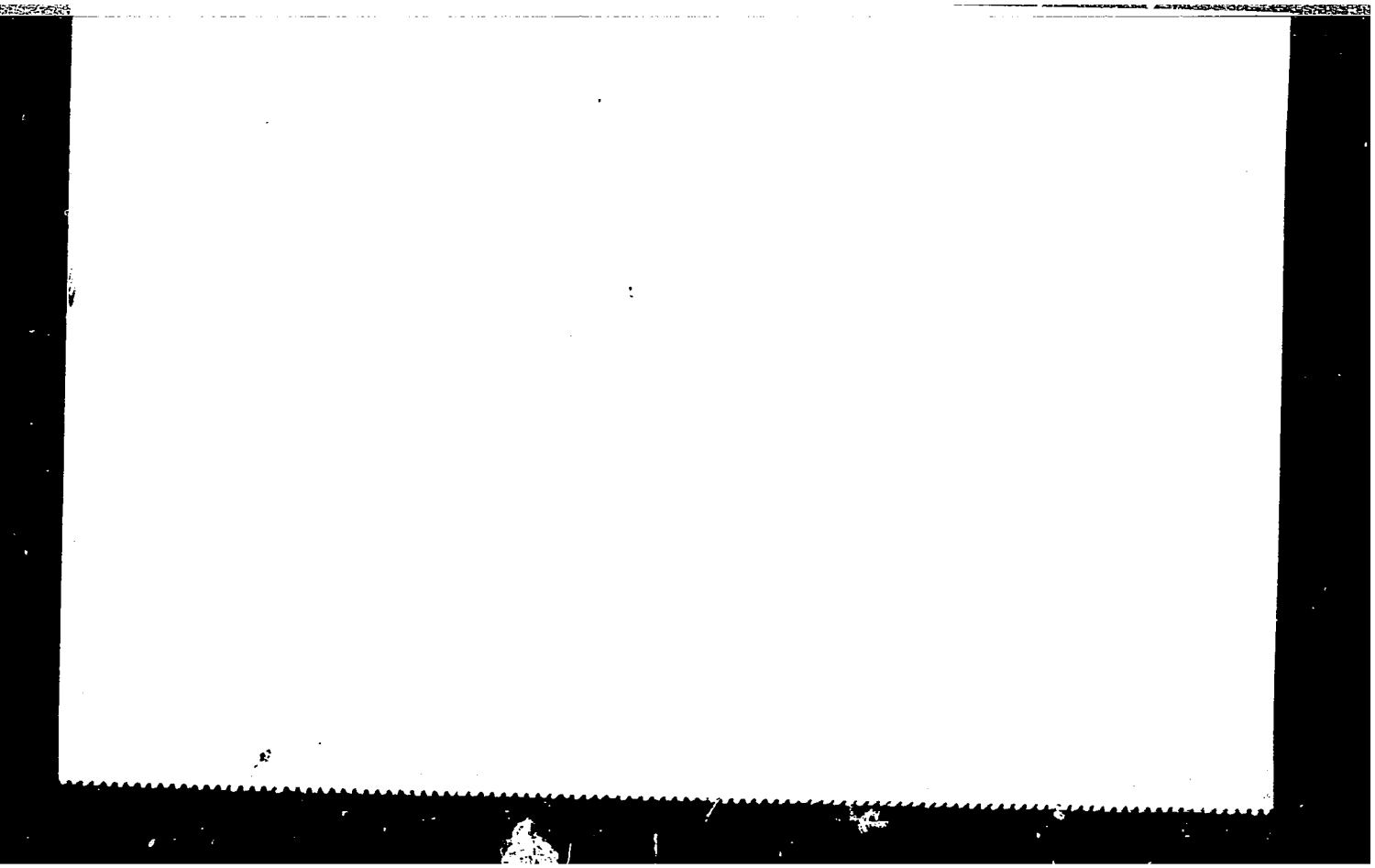

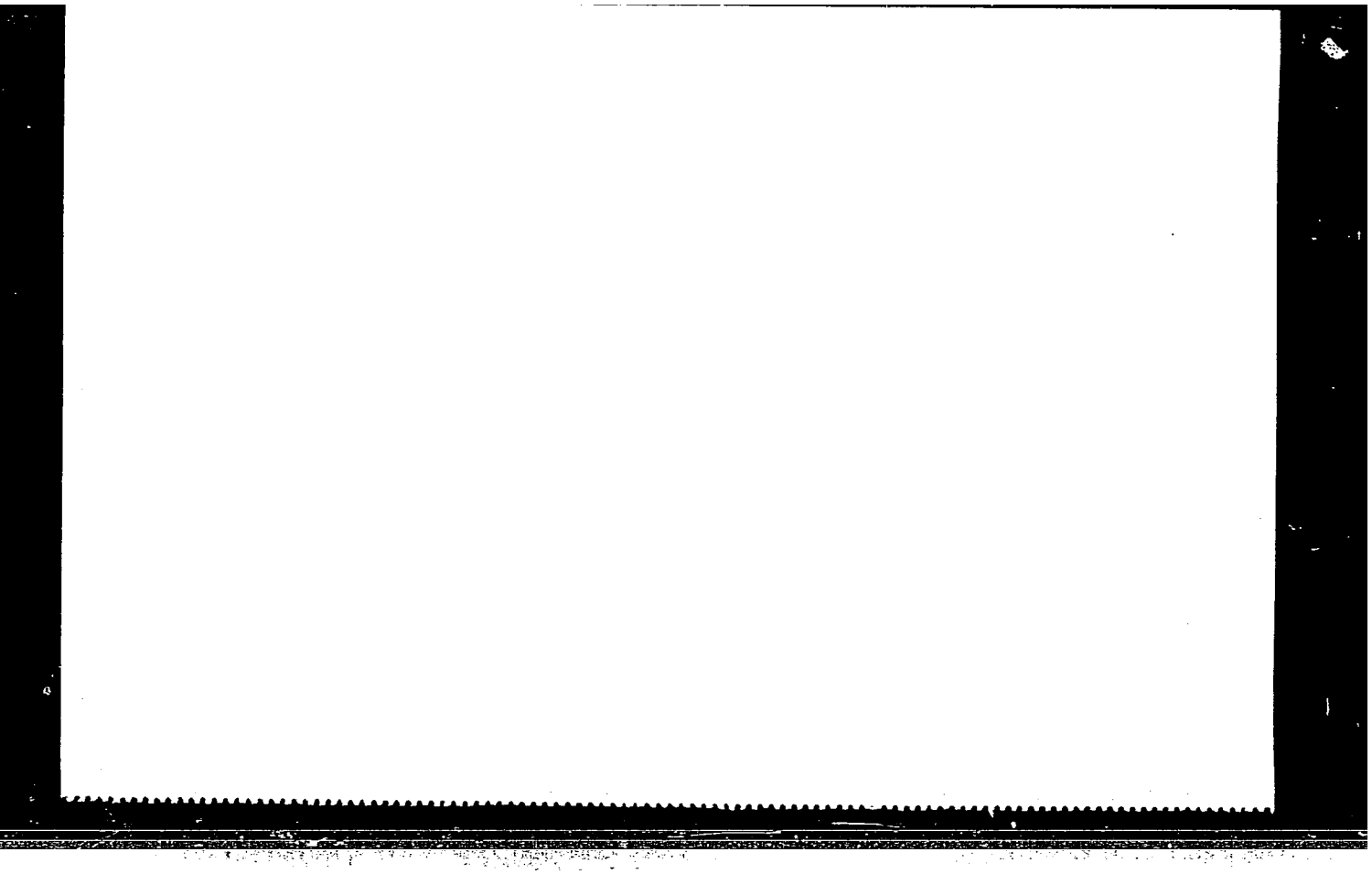

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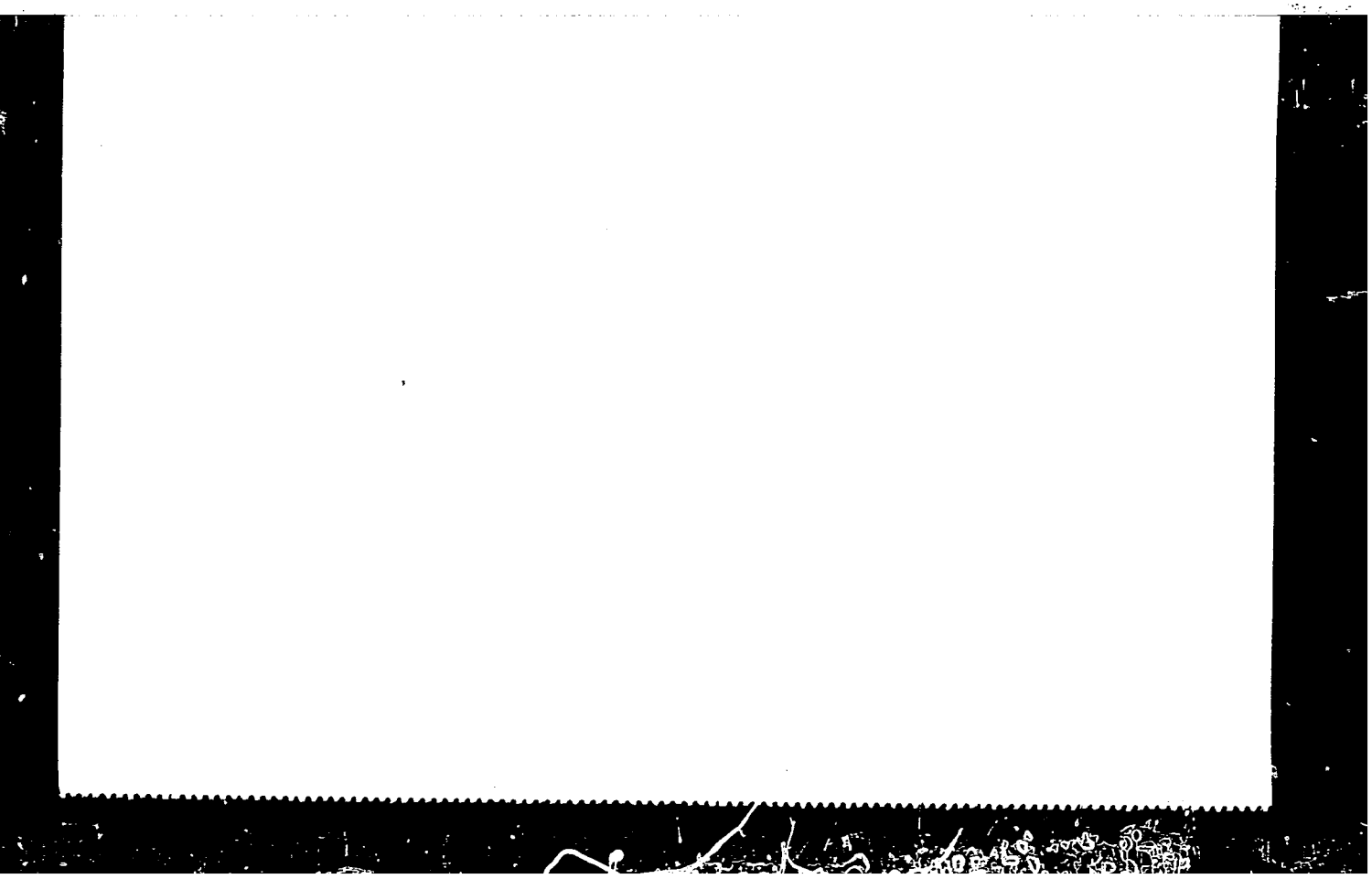

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